This case has been carefully reviewed in light of the Office Action dated September 5, 1996 wherein the disclosure was objected to because of several informalities, claim 1 was rejected under 35 U.S.C. 102(b) on Brown et al. patent 5,225,842. Claims 2, 3, 6 and 11-15 were rejected under 35 U.S.C. 103(a) on Brown et al. in view of Barnard Patent 5,119,102, claims 4, 7, 8, 18 and 19 were rejected under 35 U.S.C. 103(a) on Brown et al. and Barnard, and further in view of Janc et al. Patent 4,785,463, claims 16 and 17 were rejected under 35 U.S.C. 103(a) on Brown et al. and Barnard, and further in view of Inamiya Patent 5,160,935, claim 5 was rejected under 35 U.S.C. 103(a) on Brown et al. in view of Effland et al. Patent 5,008,679, and claims 9 and 10 were objected to as being dependent upon the rejected base claims but held allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Reconsideration and withdrawal of the rejections and objections are respectfully requested.

Claims 1-19 remain in the case.

The specification has been amended to correct minor informalities on page 10 and 13. However, it is believed that the term "whence" which appears on page 13 at line 6 is appropriate. This conjunction is defined, for example, in Webster's Ninth New Collegiate Dictionary (1991) as "1: from what place, source, or cause...2 a: from or out of which place, source, or cause... .

Claim 3, 4 and 13 have been amended to correct spelling and grammatical errors.

The rejection of claim 1 under 35 U.S.C. 102(a) on Brown et al. is not well taken. This claim recites:

"measuring data related to propagation time differences between signals transmitted from a plurality of satellites and received at said object to be tracked;

transmitting said data to a central station... ".

Thus a very important distinction between applicants' invention and the Brown et al. patent is that the measured data related to propagation time differences between signals transmitted from a plurality of satellites and received at the tracked object is transmitted to a central station. This is not true of Brown et al. While Brown et al. make pseudo range and delta range or time difference and frequency difference measurements at the sensor (which are evidently termed "raw satellite measurements" by Brown et al.), applicants do not measure ranges or time differences at the rail car receiver but instead measure only the code or bit phases associated with the received signals. Applicants transmit these code or bit phases, or their differences, including satellite identifications, to the central station, as pointed out in the paragraph bridging pages 16 and 17 of the specification. Because most of the signal processing associated with determining the rail car location is performed at the central station, power consumption, which is a major concern on a rail car that may be parked on a siding for an extended period of time, is minimized. Since the sensor of Brown et al. makes pseudo range and delta range or time difference and frequency difference measurements, the power required to make those measurements is not needed at applicants' rail car receivers. Moreover, because applicants transmit to the central station only the code or bit phase

associated with the reception time, or their differences, including the satellite identifications, the operating time of the rail car receiver need only be long enough to get a sufficient signal-to-noise ratio through averaging and is so brief that any Doppler shifts can be considered as constants. This is in contrast to Brown et al. who, at the sensor, employ a local oscillator and a temperature-compensated crystal oscillator to produce an intermediate frequency that is "far enough above DC to allow distinction between positive and negative doppler shifts" (col. 2, lines 29-46) and thereupon also employ a custom gate array not only to perform the C/A code correlation but also to remove the L-band signal doppler shift on the digital GPS signals. Here too, Brown et al. require a power expenditure which is not required by applicants. Clearly, therefore, claim 1 patentably distinguishes over Brown et al. under 35 U.S.C. 102(a).

Claim 2 is dependent from claim 1 and therefore distinguishes over Brown et al. as pointed out above. Barnard fails to remedy this deficiency of Brown et al. Therefore, even if Barnard includes, in the data transmitted from the object to be tracked, an identifying signal with the recorded satellite signals, such information, whether or not it qualifies as part of the apparently undefined "status information" transmitted from the sensor to the VLS workstation by Brown et al., the combination nevertheless neither teaches nor suggests the method of claim 2.

Claim 12, being an apparatus claim generally corresponding to method claims 1 and 2, is patentable over Brown et al. in combination with Barnard for the reasons set forth above in distinguishing claim 2 over Brown et al. and Barnard under 35 U.S.C. 103(a).

Claim 3, being dependent from claim 2, patentably distinguishes over Brown et al. and Barnard in the manner pointed out in the discussion of claim 2. Moreover, the data related to propagation time differences recited by applicants comprises code word phase measurements simultaneously derived from the signals transmitted from the plurality of satellites and received at the object to the tracked. It is these data that are transmitted by applicants to a central station. Whether or not Brown et al. are measuring these data, neither Brown et al. or Barnard appears to be concerned with transmitting these data to a central station.

Claim 6, being dependent from claim 1, patentably distinguishes over Brown et al. in the manner pointed out in the discussion of claim 1. Moreover, whether or not Brown et al. determine receiver code-time offsets and code periods, neither Brown et al. nor Barnard appear to teach or suggest transmitting such receiver code-time offsets and code periods to central station.

Claim 11 patentably distinguishes over Brown et al. in the manner previously pointed out with regard to claim 1. In addition, Brown et al. neither teach nor suggest transmitting time signals to the object over a separate channel. Brown et al. state that the sensor may be configured with from 1 to 8 channels, which has nothing to do with using a separate channel to transmit time signals to the object to be tracked. Further, it is not seen that Barnard suggests that the signals be transmitted on a different channel in the cited column 3, lines 20-26, although even if Barnard were to make such suggestion in combination with Brown et al., the combination would still fall far short of

motivating one skilled in the art to transmit time signals to the object to be tracked over a separate channel.

Claim 13, being dependent from claim 12, patentably distinguishes over Brown et al. and Barnard for the reasons said forth in discussing claim 12. Moreover, microcomputer 24 shown in Figure 2 of Brown et al. has no bearing of applicants' recited "first processor means for processing data from the receiver means related to propagation time differences for said signals" since microcomputer 24 is apparently coupled to memory map interface 74 (note Figure 4) and generates a number of signals from the in phase and quadrature input signals I and Q (column 6, lines 18-21), which is not seen to constitute data "related to propagation time differences for said signals."

Claims 14 and 15 depend from claim 13 and therefore patentably distinguish over any combination of Brown et al. and Barnard for the reasons set forth in discussing claim 13. Therefore, regardless of whether Barnard suggests that processing of the signal can be at predetermined intervals, and in addition to the fact that Barnard apparently says nothing about processing data at time intervals in synchronism with received signal events, these claims patentably distinguish over any combination of Brown et al. and Barnard for the reasons presented in the discussion of claim 13.

Claim 4 depends from claim 2 and therefore patentably distinguishes over any combination of Brown et al. and Barnard for reasons presented in discussing claim 2. Therefore, even if Janc et al. state that all known GPS receivers accomplish the measurement of bit timing, Janc et al. nevertheless fail to remedy the deficiencies of Brown et

al. and Barnard pointed out in the discussion of claim 2, and therefore claim 4 patentably distinguishes over the combination of Brown et al., Barnard and Janc et al. for the same reasons.

Concerning claim 7, the deficiencies of any combination of Brown et al., Barnard and Janc et al. as a combination of references applicable to claim 4 has been discussed above. Therefore, even if Barnard suggests that the combination include the steps of recording and transmitting the time of arrival signal with the satellite data to the central station, the combination would still be deficient as a reference against claim 7 for the reasons presented in discussing claim 4.

Concerning claim 8, the deficiencies of any combination of Brown et al., Barnard and Janc et al. as a combination of references applicable to claim 4 has been discussed above. Therefore, even if Barnard suggests measuring, at the object to be tracked, delay between the time at which the data are recorded and the time when the data are transmitted to the central station, and transmitting the measured delay to the central station, the combination would still be deficient as a reference against claim 8 for the reasons set forth in the discussion of claim 4.

Claims 18 and 19 patentably distinguish over any combination of Brown et al. and Barnard for reasons pointed out in the discussion of claim 12, and Janc et al. fail to remedy these deficiencies of Brown et al. and Barnard as references against claims 18 and 19. Moreover, even if Janc et al. teach that performance of receiver bit timing calculations is a common step during signal acquisition of GPS receivers, and that data bit timing derivation includes

the bit phase measurement as well as the offset and period calculation, applicants' system recited in claims 18 and 19 would still be unobvious in that there would be no indication as to how the system as taught by Brown et al., combined with the teachings of Barnard, could accomplish the additional functions indicated by Janc et al.

Claim 16 patentably distinguishes over Brown et al. and Barnard in the manner discussed for claim 15. Therefore, whether or not Inamiya suggests a method for positioning an observation point whereby each signal transmitted from the satellite includes a telemetry signal used in the calculation of the signal propagation delay, and whether or not the subject matter in columns 15 and 16 of Inamiya would have motivated one skilled in the art to combine the teachings of Inamiya with the system of Brown et al. and Barnard, the system of such combination would still suffer from the deficiencies pointed out in the discussion of claim 15 and therefore claim 16 would not be rendered obvious by the combination of Brown et al., Barnard and Inamiya.

Claim 17, which depends from claim 16, patentably distinguishes over any combination of Brown et al., Barnard and Inamiya for the same reasons set forth in the discussion of claim 16.

Claim 5, which depends from claim 1, patentably distinguishes over Brown et al. in the manner discussed with respect to claim 1. Whether or not Effland et al. disclose a method for locating a transmitter which includes the determination of an intersection of curves defined by the difference in propagation times of the signals, this teaching of Effland et al. would still fail to remedy the deficiencies of Brown et al. pointed out in the discussion of claim 1.

Therefore, claim 5 patentably distinguishes over any combination of Brown et al. and Effland et al.

In accordance with the foregoing, it is clear that each of rejected claims 1-7 and 11-19 are patentable to applicants, and that claims 8 and 9 which have been objected to should be held patentable in their present form. Therefore, reconsideration and allowance of each of these claims are earnestly solicited.

Respectfully submitted,

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